Idaho National Engineering and Environmental Laboratory

Technology Deployment Summary Sheet

EVOLUTION 180 PORTABLE CIRCULAR SAW

THE NEED

Deactivation and Decommissioning (D&D) Operations personnel at the Idaho National Engineering and Environmental Laboratory (INEEL) identified a need for a portable device to aid in cutting various types of thin metal (1/2" or less) such as metal piping, and metal sheeting. The current method includes using a cutting torch or porta band saw. These are time consuming, physically demanding, hazardous methods that tend to spread contamination.

THE TECHNOLOGY

The Evolution 180 Portable Circular Saw is a small, metal cutting saw with 7 or 9-inch diameter blades, powered by a 120V AC electric motor. The saw is equipped with a chip collector to minimize sparks and prevent spread of contamination. Maximum cutting thickness is one-quarter inch with a 7-inch diameter blade and one-half inch with a 9-inch blade. The saw cuts up to two inches deep and is equipped with an adjustable lever to set the depth of the cut. The saw is effective in cutting metal such as, angle steel, square tube, plate steel and pipe. Blades are selected depending on the metal to be cut with three blade options available, carbon steel, aluminum (titanium), and stainless steel. Safety features of the saw include a retractable lower blade guard to prevent exposure to the blade during operation and shutdown, an on/off guarded trigger switch and automatic overload protection. Smaller and lighter than a porta-band saw, it is easier to maneuver, operate and carry. The cost of the saw is $500 for the 7-inch and $700 for the 9-inch saw. The average cost for the saw blades is $50 to $80 depending on the blade type.

DEPLOYMENT

In April 2002, D&D Operations personnel at the INEEL deployed the 180 saw at a Test Area North Facility. The saw was used to cut one-quarter inch stainless steel plate and two inch diameter carbon steel pipe at TAN-616.

On May 29, 2002 Battelle Columbus Laboratories Decommissioning Project used a 7-inch saw at Battelle's West Jefferson site. Workers used the saw to cut one-quarter inch carbon steel plate, one-eight inch stainless steel sheet, miscellaneous aluminum bracing, and shielded galvanized drums containing lead and concrete. The saw operated very well and was considered extremely useful for cutting the metals. Cutting the drums filled with concrete and lead was not considered effective.

180 Evolution Saw Cutting Metal Pipe

RESULTS

At the INEEL, the saw cut two-inch diameter carbon steel pipes. It cut through the two-inch diameter carbon steel pipe with ease using the blade for carbon steel. On the one-quarter inch stainless steel plate, using the blade for stainless, the workers complained of kickback. It was determined that the metal plate was not fixed in place and they were not cutting in a straight line causing it to bind. When the worker clamped the metal plate down the saw performance was normal. The noise level from the saw was similar to the noise level of a typical skill saw.

The Battelle Columbus Laboratories Decommissioning Project (BCLDP) used the Evolution 180 saw to cut up shielded metal drums and various other metals in a

radioactive environment. Overall, BCLDP reported that the 180 saw was extremely useful for cutting metals and operated very well. The chip collector minimized debris and the saw itself is virtually spark free. Battelle used the saw successfully on one-quarter inch carbon steel plate, one-eighth inch stainless steel and aluminum bracing. The saw was also used on shielded drums, but the carbon metal blade bogged down in the concrete. Battelle replaced the carbon steel blade with a masonry blade designed to accommodate metal. The performance (with the masonry blades) on the shielded drums was only marginal. Optimal cutting results occurred when using stainless steel blades to dismantle the drums. Based on this experience it is not recommended for use on composite substances such as liners on concrete.

BENEFITS

- A chip collector minimizes debris and spread of contamination.
- The process is nearly spark free.
- Cuts faster than the Porta-band saw.
- Reduces time workers are exposed to hazardous conditions, such as radiation.
- Lightweight, weighing only 13 pounds.

CONTACTS

- Willettia Amos, Project Manager, U.S. Department of Energy, Idaho Operations Office, (208) 526-4097.
- Jeet Malhotra, U.S. Department of Energy, National Energy and Technology Laboratory, DDFA (304) 285-4053.
- Dick Meservey, Program Manager, Idaho National Engineering and Environmental Laboratory (208) 526-1834.
- Vince Daniel, Test Engineer, Idaho National Engineering and Environmental Laboratory, Environmental Remediation Technology (208) 526-5738.
- Amy Klash, Ocean Machinery, Inc. Fort Lauderdale, FL, (954) 351-0899.